PROJECT FACT SHEET

CONTRACT TITLE: Advanced Reservoir Characterization and Development Through High Resolution 3C3D Seismic and Horizontal Drilling: Eva South Morrow Sand Unit, Texas County, OK/Class Revisits

ID NUMBER: DE-FC26-00BC15120

B&R CODE: AC1010000

CONTRACTOR: Ensign Operating Company

ADDR: 1225 17th Street
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DOE PROJECT MANAGER:

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CONTRACT PROJECT MANAGER:

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PROJECT SITE
CITY: Denver **STATE:** CO
CITY: Eva South Field, Texas **STATE:** OK
County **STATE:**
CITY:

CONTRACT PERFORMANCE PERIOD:
2/29/2000 to 7/31/2001

PROGRAM: Reservoir Life Extension
RESEARCH AREA: Seismic/Class
PRODUCT LINE: ADIS

CO-PARTICIPANTS:

PERFORMER:	**CITY:**	**STATE:**	**CD:**
PERFORMER:	**CITY:**	**STATE:**	**CD:**
PERFORMER:	**CITY:**	**STATE:**	**CD:**
PERFORMER:	**CITY:**	**STATE:**	**CD:**

FUNDING (1000'S)	DOE	CONTRACTOR	TOTAL
PRIOR FISCAL YRS	637	984	1621
FY 2002 CURRENT OBLIGATIONS	0	0	0
FUTURE FUNDS	0	0	0
TOTAL EST'D FUNDS	637	984	1621

OBJECTIVE: Improve reservoir characterization and waterflood sweep efficiency.

March 2002

PROJECT DESCRIPTION:

Background: Eva South Unit is a combination structural/ stratigraphic trap at approximately 5600 feet in depth. Estimated ultimate primary recovery is 1,288 MBO, representing a 17.8% recovery factor. Ensign Operating Company acquired the field in 1993 and initiated a waterflood project. The field responded in nine months. Secondary recovery is estimated to be 1, 276 MBO. Due primarily to compartmentalization, it has been determined that an additional 450 MBO could be recovered if sweep efficiency could be improved.

Four reservoir compartments, formed by abandoned channel-fill deposits and faulting, have been defined at Eva South Unit. Synthetic seismic models were constructed that indicated the compartmentalization could be resolved through high-resolution 3D seismic. In additional to the standard compressional (P-wave) component, two mode-converted shear-wave (S-wave) components are recorded (3C3D) This is a relatively new technology for land-based operations.

Work to be Performed: This project uses an advanced reservoir characterization and development technique called 3C3D. This will allow for improved understanding with respect to where the horizontal wells should be located. It is expected that a maximum of three wells will be drilled to test the effectiveness of the seismic characterization. The purpose for developing this technology is to improve the waterflood sweep efficiency. If successful, the technology will have widespread application. The project success is expected to be presented at workshops and meetings.

PROJECT STATUS:

Current Work: Budget Period I.

Scheduled Milestones:

Complete 3C3D seismic interpretation and identify reservoir compartments	01/00
Drill and Complete 13-h horizontal well	02/00
Monitor production of 13-H well	04/00
Determine additional horizontal well locations and evaluate economic feasibility	01/01
Quantify improved waterflood efficiency	06/01
Final report	11/01

Accomplishments: 3C3D seismic interpretations are approximately 75% complete. Drilled and set production casing in the 13-H horizontal well. Horizontal well was drilled and in production 1st quarter 2000. Seismic definition allowed the well to be drilled within 200 feet of the Teepee Creek fault.

TECHNOLOGY TRANSFER:

Technology/Information Transfer: Presentation by D. Wheeler at South Mid Continent PTTC meeting, Norman, Oklahoma, November 1999.

Presentation by W. Miller and D. Wheeler at the Rocky Mountain Association of Geologists 3-D Seismic Symposium, Denver, Colorado, February 2000.

Presentation by D. Wheeler at the Rocky Mountain Section of SEPM, Denver, Colorado, March 2000.

Presentation by D. Wheeler at Denver Association of Lease Title Analysts, Denver, Colorado, April 2000.

Presentation by J. Pope and D. Wheeler at Denver Section of SPE, Denver, Colorado, May 2000

Presentation by D. Wheeler at NPTO, DOE, Oil Technology Program Contractor Review Meeting, June 2000.

Presentation by D. Wheeler, W. Miller and T. Wilson at National AAPG Convention, Denver, Colorado, June 2001

Presentation by T. Wilson, T. Davis, D. Wheeler, W. Miller and M. Sterling at International SEG Convention, San Antonio, Texas, September 2001.

Wheeler, D., Pope, J., Miller, W., 2000, Improved Recovery at Eva South Unit: The Class Act, NPTO, Tulsa, OK, Vol 6, No. 2.

Miller, W. and Wheeler, D., 2000, 3C-3D Seismic Characterization of the Eva South Morrow Sand Unit, Texas County, Oklahoma; in6th Annual 3-D Seismic Symposium, RMAG.

No Author, 2000, Old Dog new Tricks: Hart's E & P, May 2000, p. 13.

Van Dok, R. and J. Gaiser, September 2001, Stratigraphic description of the Morrow Formation using mode-converted shear waves: Interpretation tools and techniques for three land surveys, The Leading Edge, Society of Exploration Geophysists, Vol. 20, No. 9, page 1042-1047.

Public Relations:

Updated By: Dan Ferguson **Date:** 12/11/2001